Predominance of Anger in Depressive Disorders Compared With Anxiety Disorders and Somatoform Disorders

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Objective: The object of this study was to make a comparison regarding various dimensions of anger between depressive disorder and anxiety disorder or somatoform disorder.

Method: The subjects included 73 patients with depressive disorders, 67 patients with anxiety disorders, 47 patients with somatoform disorders, and 215 healthy controls (diagnoses made according to DSM-IV criteria). Anger measures—the Anger Expression Scale, the hostility subscale of the Symptom Checklist-90-Revised (SCL-90-R), and the anger and aggression subscales of the Stress Response Inventory were used to assess the anger levels. The severity of depression, anxiety, phobia, and somatization was assessed using the SCL-90-R.

Results: The depressive disorder group showed significantly higher levels of anger on the Stress Response Inventory than the anxiety disorder, somatoform disorder, and control groups (p < .05). The depressive disorder group scored significantly higher on the anger-out and angertotal subscales of the Anger Expression Scale than the somatoform disorder group (p < .05). On the SCL-90-R hostility subscale, the depressive disorder group also scored significantly higher than the anxiety disorder group (p < .05). Within the depressive disorder group, the severity of depression was significantly positively correlated with the anger-out score (r = 0.49, p < .001), whereas, in the somatoform and anxiety disorder groups, the severity of depression was significantly positively correlated with the anger-in score (somatoform disorder: r = 0.51, p < .001; anxiety disorder: r = 0.57, p < .001).

Conclusion: These results suggest that depressive disorder patients are more likely to have anger than anxiety disorder or somatoform disorder patients and that depressive disorder may be more relevant to anger expression than somatoform disorder.

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A nger refers to an emotional state varying from mild annoyance to rage. The construct of anger was defined by Spielberger et al.¹ Anger-in, or anger suppression, refers to the inhibition of overt expression of anger, while anger-out, or anger expression, refers to an overt display of verbal and/or physically aggressive behaviors. Anger expression may have more negative effects than positive effects as a catharsis unless it occurs in a constructive manner. Hostility refers to an attitudinal predisposition to become angry, often associated with concomitant aggressive behavior.²

In general, anger is known to be a core stress response.³ A number of studies have found that anger is related to a variety of mental disorders, including depressive disorder. Approximately 30% to 40% of depressive disorder patients have been reported to have anger attacks.⁴ It was found that depressed outpatients had significantly higher rates of anger attacks than healthy volunteers.⁵ Anger was also common among depressed postpartum women.⁶ High levels of hostility are quite common among depressed patients.⁷ One epidemiologic catchment area study found a significant association between depression and violent behavior in community samples.⁸

Although anger attacks have been most strongly related to unipolar depression, they also occur in association with anxiety disorders, eating disorders, and personality disorders and in the absence of any psychiatric illness.^{4,9-15} Nonetheless, it was found that patients with depressive disorders had twice the prevalence of anger attacks that anxiety disorder patients had.¹⁰ On the other hand, the severity of depressive symptoms appears to be the most significant predictor of the presence of anger attacks among eating and anxiety disorder populations.^{10,11} Thus, these studies suggest that depression may play an important role in the anger of patients with disorders other than depressive disorder.

In addition, hostility, particularly repressed hostility, and anger have been described by several authors as crucial factors in somatization.¹⁶ Psychosomatic disorders, such as essential hypertension,^{17–19} coronary heart disease,²⁰ and chronic headache,²¹ are also known to be associated with anger suppression.

Anger and depression have long been hypothesized to be associated and causally linked. Most theories of depression acknowledge a causal link between repressed anger and depression.^{22,23} Research, however, has not clearly shown such association.²⁴⁻²⁶

On the other hand, anger/hostility levels in depressed patients were found to decrease with recovery after treatment with the tricyclic antidepressant amitriptyline²⁷ and the selective serotonin reuptake inhibitor fluoxetine.⁹ In another study on outpatients, the reduction in hostility was positively related to decreases in depressive symptoms.¹⁴ These results suggest that depression may be closely associated with anger and that neurotransmission relevant to depression may be involved in anger.

Comparative data are scarce among other mental disorder groups, which makes it difficult to determine whether this association with anger is unique to depressive disorders. In this study, a comparison was made between the anger in the depressive disorder group and that in the anxiety disorder group and somatoform disorder group. The authors examined the relationships between the severity of depression of each disorder group and anger and used anger measurements that could reflect a variety of dimensions of anger, such as anger expression and anger suppression as well as hostility and aggressive behavior.

METHOD

Subjects and Procedures

Outpatients from the Departments of Psychiatry at Severance Hospital and Yongdong Severance Hospital (both in Seoul, Korea) with diagnoses of depressive disorder, anxiety disorder, or somatoform disorder were involved in this study. Diagnoses were made by 2 experienced psychiatrists (K.B.K., C.H.K.) on the basis of DSM-IV²⁸ criteria. Patients were eligible to participate if they were at least 18 years old. However, dually diagnosed patients were excluded from this study, including those with a combination of each of the above disorders and physical diseases or other psychiatric disorders. Subjects were consecutively selected and interviewed and were given verbal and written explanation of the study outline. Only those patients who consented to the study completed the questionnaire, which included items regrading sociodemographic characteristics as well as self-rating scales. All but 5 patients completed the questionnaire.

The healthy controls included hospital employees, family members of medical students, and family members of general ward patients. They were each sent a letter of consent and the questionnaire, along with a written explanation of the study. All but 11 subjects completed the questionnaire and returned it to the authors. Two hundred fifteen healthy subjects (108 men, 107 women) 18 years of age or older (mean \pm SD = 41.7 \pm 10.4 years) participated in the study. Before they were screened for the presence or absence of physical and psychiatric disorders via the questionnaire, subjects other than the medical students' family members were contacted directly by psychiatric residents to make sure that they had no physical and psychiatric disorders. For family members of medical students, we asked the medical students to check the presence or absence of physical and psychiatric disorders and to include only those who had no disorders. Also, from the self-report questionnaire, none of these subjects reported being treated for physical or psychiatric disorders or having symptoms of such disorders.

The depressive disorder group included 45 patients with major depressive disorder and 28 with dysthymic disorder (32 men and 41 women in total). The anxiety disorder group consisted of 45 patients with panic disorder, 13 with generalized anxiety disorder, and 9 with phobic disorder (37 men and 30 women in total). The somatoform disorder group included 22 patients with undifferentiated somatoform disorder, 8 with somatization disorder, 11 with pain disorder, 3 with hypochondriasis, 2 with conversion disorder, and 1 with body dysmorphic disorder (26 men and 21 women in total). Their sociodemographic characteristics are described in Table 1.

The psychological measures included the Korean version²⁹ of the Anger Expression Scale,¹⁷ the anger and aggression subscales of the Stress Response Inventory,³⁰ and the hostility, depression, anxiety, phobia, and somatization subscales of the Korean version³¹ of the Symptom Checklist-90-Revised (SCL-90-R).³² The Anger Expression Scale is a 22-item self-rating instrument designed to assess the levels of anger expression (anger-out) and anger suppression (anger-in). In this study, it was rated on a 4-point scale ranging from 1 to 4. The Stress Response Inventory is a 39-item self-rating instrument developed for assessing the severity of stress responses during the last week. The anger subscale of the Stress Response Inventory has 4 items, and the aggression subscale has 6 items. They were rated on a 5-point scale ranging from 1 to 5. The SCL-90-R is a 90-item self-rating instrument for assessing psychopathology during the last week and includes 9 subscales. The hostility subscale of the SCL-90-R has 6 items, and the depression subscale has 13 items.

Table 1. Sociodemographic	Characteristics ^a
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	Depressive	Anxiety	Somatoform	Healthy				
	Disorder	Disorder	Disorder	Controls				
Characteristic	(N = 73)	(N = 67)	(N = 47)	(N = 215)	Statistic	df	р	
Sex								
Male	32 (43.8)	37 (55.2)	26 (55.3)	108 (50.2)				
Female	41 (56.2)	30 (44.8)	21 (44.7)	107 (49.8)	$\chi^2 = 2.34$	3	.51	
Age, y, mean \pm SD	38.3 ± 12.3	38.4 ± 11.5	37.3 ± 13.1	41.7 ± 10.4	F = 3.54	3	.02	
Education, y, mean \pm SD	13.4 ± 3.6	13.8 ± 2.9	12.2 ± 4.0^{b}	14.2 ± 3.0	F = 5.27	3	.001	
Religion								
Present (52 (72.2)	53 (81.5)	28 (68.3)	135 (65.2)				
Absent	20 (27.8)	12 (18.5)	13 (31.7)	72 (34.8)	$\chi^2 = 6.53$	3	.09	
Marital status								
Married	44 (67.7)	48 (77.4)	26 (65.0)	161 (77.8)				
Single	20 (30.8)	14 (22.6)	14 (35.0)	46 (22.2)	$\chi^2 = 4.48$	3	.21	
Monthly income (\times \$1000), mean \pm SD	2.23 ± 0.95	$2.46 \pm 0.76^{\circ}$	2.01 ± 0.80^{d}	2.52 ± 0.70	$\ddot{F} = 6.71$	3	<.001	
Duration of illness, mo, mean ± SD	19.4 ± 29.5	21.9 ± 25.7	25.6 ± 32.9		F = 0.66	2	.52	

^aValues shown as N (%) unless otherwise noted.

^bLower in somatoform disorder patients than in healthy controls (Scheffé test, p < .05).

Greater in patients with anxiety disorder than in those with somatoform disorder (Scheffé test, p < .05).

^dLower in somatoform disorder patients than in healthy controls (Scheffé test, p < .05).

Table 2. Symptom Checklist-90-Revised (SCL-90-R) Subscale Scores (mean ± SD) by Psychiatric Diagnosis*							
	Depressive	Anxiety	Somatoform	Healthy			
SCL-90-R	Disorder	Disorder	Disorder	Controls			
Subscale	(N = 73)	(N = 67)	(N = 47)	(N = 215)	F	df	р
Depression	63.5 ± 14.4^{a}	52.7 ± 12.2 ^b	56.1±14.7°	46.4 ± 10.2	39.74	3,398	< .001
Anxiety	61.6 ± 15.3^{d}	57.0 ± 14.1^{e}	$57.4 \pm 14.3^{\rm f}$	47.9 ± 9.9	28.39	3,398	< .001
Phobia	58.7 ± 18.2^{g}	60.6 ± 16.8^{h}	$> 56.4 \pm 17.7$	50.2 ± 12.6	11.47	3,398	< .001
Somatization	56.5 ± 14.9^{i}	$53.0 \pm 10.8^{\mathrm{j}}$	56.8 ± 16.5^{k}	47.9 ± 10.2	13.96	3,398	< .001

*Significant between-group differences (Scheffé test, p < .05) were as follows: ^adepressive disorder > anxiety disorder, somatoform disorder, and healthy controls; ^banxiety disorder > healthy controls; ^csomatoform disorder > healthy controls; ^ddepressive disorder > healthy controls; ^eanxiety disorder > healthy controls; ^fsomatoform disorder > healthy controls; ^fanxiety disorder > health

Data Analysis

Analysis of variance (ANOVA) was conducted to compare the scores of each of the psychological measures and some sociodemographic data (age, income, and duration of education) among the 4 groups. The Scheffé test was then employed as a post hoc test. Comparisons of anger measures for the types of depressive disorders (major depressive disorder vs. dysthymic disorder) were made using the Student t test. Comparisons of demographic data such as gender, marital status (married vs. single), and religion (present vs. absent) among the groups were made using the chi-square test. Pearson correlation was used to determine the relationships of demographic data, such as age, level of education, income, and duration of illness, with the anger measure scores. Two-way ANOVA was also conducted to examine the interaction of gender and group.

RESULTS

Sociodemographic Data

The sociodemographic characteristics of the patient and control groups are described in Table 1. Patients with somatoform disorders had a significantly lower level of education than healthy controls. The somatoform disorder group had a significantly lower income than the anxiety disorder and control groups. However, no significant differences were found in terms of gender, marital status (married vs. single), or religion (present vs. absent) among the 4 groups, which included 3 types of patients and healthy controls.

Relationship Between Psychiatric Diagnoses and SCL-90-R Subscale Scores

The relationship between psychiatric diagnoses and scores on the SCL-90-R subscales relevant to the diagnoses was examined to confirm the validity of the diagnoses made by the 2 psychiatrists. As a result, the depressive disorder group was characterized by the highest mean scores on each of the depression and anxiety subscales. The anxiety disorder group had the highest mean scores on the phobia subscale, and the somatoform disorder group had the highest mean scores on the somatization subscale (Table 2).

Correlations of Outcomes on the Different Anger Rating Scales

The anger-total scores of the Anger Expression Scale correlated significantly with each of the subscale scores of other scales (SCL-90-R hostility: r = 0.57, p < .001; Stress Response Inventory anger: r = 0.54, p < .001; Stress

Fable 3. Scores (mean \pm SD) for Anger in Each Disorder Group and the Control Group*							
Anger Measure	Depressive Disorder (N = 73)	Anxiety Disorder (N = 67)	Somatoform Disorder (N = 47)	Healthy Controls (N = 215)	F	df	р
Anger Expression Scale							
Anger-in	22.8 ± 7.1	23.6 ± 5.9	22.3 ± 6.8	21.7 ± 5.5	1.91	3,396	.13
Anger-out	21.0 ± 8.3^{a}	18.3 ± 5.6	16.7 ± 4.6	19.1 ± 5.4	5.32	3,396	.001
Anger-total	43.8 ± 9.9^{b}	41.9 ± 7.1	39.0 ± 7.9	40.8 ± 8.0	3.89	3,396	.009
SCL-90-R hostility	$54.4 \pm 13.5^{\circ}$	48.4 ± 11.2	49.6 ± 12.3	46.9 ± 8.6	9.33	3,398	<.001
Stress Response Inventory							
Anger	16.4 ± 6.1^{d}	$13.4 \pm 5.0^{\rm e}$	$13.8 \pm 5.4^{\rm f}$	11.0 ± 4.2	24.78	3,398	<.001
Aggression	$7.2\pm3.8^{\mathrm{g}}$	5.8 ± 3.4	6.1 ± 3.4	5.9 ± 2.4	3.87	3,397	.009

*Abbreviations: anger-in = anger suppression, anger-out = anger expression, SCL-90-R = Symptom Checklist-90-Revised. Significant betweengroup differences (Scheffé test, p < .05) were as follows: ^adepressive disorder > somatoform disorder; ^bdepressive disorder > somatoform disorder; ^cdepressive disorder > anxiety disorder and healthy controls; ^ddepressive disorder > anxiety disorder, and healthy controls; ^eanxiety disorder > healthy controls; ^gdepressive disorder > healthy controls.

Response Inventory aggression: r = 0.45, p < .001). The score on the SCL-90-R hostility subscale also correlated significantly with the Stress Response Inventory anger (r = 0.71, p < .001) and aggression (r = 0.79, p < .001) subscale scores. Thus, all these anger scales and subscales can be effectively used as instruments for measuring anger levels, although the nature of each of the scales may be different.

Comparison of Anger and Depression Among Disorder and Control Groups

The depressive disorder, anxiety disorder, and somatoform disorder groups scored significantly higher on the Stress Response Inventory anger subscale than the healthy controls. A comparison across the 3 disorder groups was made of scores on the anger scales used in the study. The depressive disorder group scored significantly higher on the anger-out and anger-total subscales of the Anger Expression Scale than the somatoform disorder group and higher on the anger subscale of the Stress Response Inventory than the somatoform disorder and anxiety disorder groups. In addition, the depressive disorder group scored significantly higher on the SCL-90-R hostility subscale than both the anxiety disorder and the control groups. On the Stress Response Inventory aggression subscale, the depressive disorder group scored significantly higher than the control group (Table 3).

The level of depression, as measured by the depression subscale of the SCL-90-R, was significantly higher in the depressive disorder group compared with the anxiety disorder, somatoform disorder, and control groups. Also, each of the patient groups showed a significantly greater level of depression than the control group (see Table 2).

Relationship Between Severity of Depression and Anger Measures in Each of the Disorder Groups and Control Group

The depressive disorder group showed significant positive correlations between the level of depression and the anger measures, including the Anger Expression Scale Table 4. Scores (mean \pm SD) on Anger Measures in Major Depression and Dysthymic Disorder^a

	Major Depression	Dysthymic Disorder				
Anger Measure	(N = 48)	(N = 25)	t	df	р	
Anger Expression Scale						
Anger-in	22.1 ± 7.0	24.2 ± 7.3	-1.21	71	.23	
Anger-out	22.3 ± 8.2	18.5 ± 8.2	1.88	71	.07	
Anger-total	44.4 ± 10.3	42.7 ± 9.3	0.68	71	.50	
SCL-90-R hostility	55.2 ± 13.8	53.0 ± 13.1	0.65	71	.52	
Stress Response Inventory						
Anger	11.5 ± 4.4	10.4 ± 3.9	1.05	71	.30	
Aggression	7.4 ± 3.8	6.8 ± 3.8	0.60	71	.55	
^a Abbreviations: anger-in = anger suppression, anger-out = anger expression, SCL-90-R = Symptom Checklist-90-Revised.						

anger-out (r = 0.49, p < .001) and anger-total (r = 0.50, p < .001) subscales, the SCL-90-R hostility subscale (r = 0.72, p < .001), and the Stress Response Inventory anger (r = 0.72, p < .001) and aggression (r = 0.56, p < .001) subscales; the exception was the Anger Expression Scale anger-in subscale (r = 0.12, p = .31). On the other hand, no significant differences were found on the scores of any of the anger scales between the major depression group and the dysthymic disorder group (Table 4).

In the somatoform disorder and anxiety disorder groups, the levels of depression were significantly positively correlated with the anger measures as shown by scores of the Anger Expression Scale anger-in (r = 0.51, p < .001; r = 0.57, p < .001) and anger-total (r = 0.41, p = .005; r = 0.62, p < .001) subscales, the SCL-90-R hostility subscale (r = 0.66, p < .001; r = 0.72, p < .001), and the Stress Response Inventory anger (r = 0.48, p = .001; r = 0.75, p < .001) and aggression (r = 0.48, p = .001; r = 0.62, p < .001) subscales; the exception was the Anger Expression Scale anger-out subscale score (r = -0.06, p = .68; r = 0.17, p = .15).

The control group showed significant positive correlations between the level of depression and the anger measures, such as the Anger Expression Scale anger-in (r = 0.45, p < .001), anger-out (r = 0.43, p < .001), and anger-total (r = 0.60, p < .001) subscales; the SCL-90-R

hostility subscale (r = 0.81, p < .001), and the Stress Response Inventory anger (r = 0.63, p < .001) and aggression (r = 0.45, p < .001) subscales.

Relationship Between Sociodemographic Variables and Anger in the Depressive Disorder Group

In the depressive disorder group, men scored significantly higher than women in the Anger Expression Scale anger-out subscale $(23.2 \pm 8.3 \text{ vs. } 19.3 \pm 8.0; \text{ t} = 2.04,$ df = 71, p = .045). However, no significant differences were found in scores on the anger-in $(21.8 \pm 5.3 \text{ vs.})$ 23.6 ± 8.2 ; t = -1.08, df = 69, p = .28) and anger-total $(45.1 \pm 8.9 \text{ vs. } 42.9 \pm 10.7; \text{ t} = .94, \text{ df} = 71, \text{ p} = .35)$ subscales, the SCL-90-R hostility subscale (54.8 ± 13.2 vs. 54.1 ± 13.9 ; t = .22, df = 71, p = .83), and the Stress Response Inventory anger $(15.9 \pm 5.4 \text{ vs. } 16.9 \pm 6.6;$ t = -.68, df = 71, p = .50) and aggression (7.5 ± 4.1 vs. 6.9 ± 3.5 ; t = .67, df = 71, p = .50) subscales. Age, level of education, income, and duration of illness had no significant correlations with scores on the anger-in (r = -0.03, p = .81; r = -0.002, p = .99; r = 0.01, p = .93;r = 0.15, p = .19), anger-out (r = -0.07, p = .56; r = 0.01, p = .94; r = 0.10, p = .41; r = -0.09, p = .44), and angertotal (r = -0.08, p = .51; r = 0.007, p = .96; r = 0.09, p = .46; r = 0.03, p = .78) subscales; the hostility subscale (r = -0.12, p = .31; r = -0.13, p = .27; r = -0.10, p = .39;r = 0.01, p = .95; and the anger (r = -0.06, p = .61; r = -0.17, p = .15; r = -0.20, p = .09; r = 0.05, p = .66) and aggression (r = -0.20, p = .09; r = -0.03, p = .83;r = -0.10, p = .41; r = 0.02, p = .90) subscales.

In addition, no significant differences were found between married and single subjects in the Anger Expression Scale anger-in (22.0 ± 7.1 vs. 23.5 ± 5.8 ; t = -.83, df = 62, p = .41), anger-out (20.2 ± 7.7 vs. 22.7 ± 9.3 ; t = -1.11, df = 62, p = .27), and anger-total (42.3 ± 9.1 vs. 46.2 ± 8.7 ; t = -1.64, df = .62, p = .11) subscales; the SCL-90-R hostility subscale (53.1 ± 11.7 vs. 55.7 ± 15.0 ; t = -.76, df = 62, p = .45); and the Stress Response Inventory anger (16.1 ± 6.2 vs. 17.0 ± 5.6 ; t = -.58, df = 62, p = .57) and aggression (6.6 ± 3.3 vs. 7.5 ± 4.1 ; t = -.98, df = 62, p = .33) subscales.

Since a significant difference was found in the angerout score between men and women in the depressive disorder group, 2-way ANOVA was conducted to determine the interaction of gender and group. This test revealed a significant gender-by-group interaction (F = 2.81, df = 3, p = .04). Finally, it was discovered that regardless of gender, the depressive disorder group scored significantly higher than the somatoform disorder group on the angerout subscale.

DISCUSSION

We examined the association between psychiatric diagnoses and scores on the SCL-90-R subscales relevant

to the diagnoses to confirm the validity of the psychiatric diagnoses made by the 2 psychiatrists. As shown in Table 2, each disorder group was consistent with its relevant SCL-90-R subscale, with the highest mean score on the respective subscales.

This study found that the depressive disorder patients showed a greater level of SCL-90-R hostility and Stress Response Inventory anger and aggression than the healthy subjects. In other studies, levels of anger and hostility were increased in depressed patients compared with normal controls.^{2,33} Thus, depressive disorder could be considered a risk group for anger or hostility.

In particular, the depressive disorder group scored significantly higher on the anger and hostility subscales than the anxiety disorder group. In another study, it was found that depressed patients had more frequent anger attacks when compared with anxiety disorder patients.¹⁰ Also, the depressive disorder group had significantly higher scores on the Anger Expression Scale anger-out and anger-total subscales and the Stress Response Inventory anger subscale than the somatoform disorder group. These results indicate that the depressive disorder patients exhibited the highest levels of general anger responses among the 3 disorder groups and that anger might be characteristic of the stress responses of depressive disorder patients, although the anxiety disorder and somatoform disorder patients showed higher anger levels than the healthy controls. Furthermore, from the findings that the level of depression was significantly higher in the depressive disorder group compared with the anxiety disorder and somatoform disorder groups, it is strongly suggested that depression is likely to be associated with anger.

Previous research has linked anger suppression with depression, and the "anger-turned-in" hypothesis was proposed as a psychodynamic theory of depression.^{34–37} However, our present study found that the depressive disorder group showed significantly higher scores on the Anger Expression Scale anger-out subscale than the somatoform disorder group and that the severity of depression in the depressive disorder group was also positively correlated with scores on the anger-out subscale. These results suggest that depressive disorder may be more related to anger expression than somatoform disorder. Other studies, in agreement with our findings, have shown that depression is related to the overt expression of hostility.^{38–40}

In other studies, increases in the levels of anger experience and anger suppression have been identified as possible causes of depression, whereas depression may also cause changes in anger dimensions via mediating factors, such as learned helplessness,⁴¹ neurochemical changes,⁴² or interactional patterns.⁴³

In this study, no significant difference was found on the scores of any of the anger scales between patients with major depression and those with dysthymic disorder. In another study, however, patients with major depression were reported to have more anger attacks than patients with dysthymia.⁴

On the other hand, the severity of depression in the somatoform disorder and anxiety disorder groups was significantly positively correlated with Anger Expression Scale anger-in scores. These results suggest that anger suppression may be related to depression in the anxiety disorder and somatoform disorder groups.

With respect to the relationship between gender and anger in the depressive disorder group, men scored significantly higher on the Anger Expression Scale anger-out subscale than women. This finding suggests that men are more likely to express anger than women. In previous studies, however, women were found to have more severe depression,⁴⁴⁻⁴⁶ stress experiences,⁴⁷ and stress responses³⁰ than men.

Several conclusions can be drawn from our study. First, depressive disorder patients are more likely to have anger than anxiety disorder and somatoform disorder patients. Second, depressive disorder may be more relevant to anger expression than somatoform disorder. Finally, it is strongly suggested that depression is likely to be associated with anger. Further studies are required to investigate the causal relationship between anger and depression in depressive disorders. In addition, the effect of treatment for depression on anger expression and anger suppression in depressive disorder patients and the difference of such effects between patients with depressive disorders and other psychiatric patients need to be examined.

Drug names: amitriptyline (Elavil and others), fluoxetine (Prozac and others).

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents has been presented in this article that is outside U.S. Food and Drug Administration–approved labeling.

REFERENCES

- Spielberger CD, Jacobs G, Russell S, et al. Assessment of anger: the State-trait Anger Scale. In: Butcher JN, Spielberger CD, eds. Advances in Personality Assessment, vol 2. Hillsdale, NJ: Erlbaum; 1983:157–187
- Riley WT, Treiber FA, Woods MG. Anger and hostility in depression. J Nerv Ment Dis 1989;177:668–674
- van Praag HM. Anxiety and increased aggression as pacemakers of depression. Acta Psychiatr Scand 1998;98(393, suppl):81–88
- Fava M, Nierenberg AA, Quitkin FM, et al. A preliminary study on the efficacy of sertraline and imipramine on anger attacks in atypical depression and dysthymia. Psychopharmacol Bull 1997;33:101–103
- Fava M, Rosenbaum JF, McCarthy M, et al. Anger attacks in depressed outpatients and their response to fluoxetine. Psychopharmacol Bull 1991; 27:275–279
- Pitt B. Atypical depression following childbirth. Br J Psychiatry 1968;114: 1325–1335
- Fava M. Depression with anger attacks. J Clin Psychiatry 1998;59 (suppl 18):18–22
- Swanson JW, Holzer CE, Ganju VK, et al. Violence and psychiatric disorder in the community: evidence from the Epidemiologic Catchment Area surveys. Hosp Community Psychiatry 1990;41:761–770
- Fava M, Rosenbaum JF, Pava J, et al. Anger attacks in unipolar depression, 1: clinical correlates and response to fluoxetine treatment. Am J Psychiatry

1993;150:1158-1163

- Gould RA, Ball S, Kaspi SP, et al. Prevalence and correlates of anger attacks: a 2 site study. J Affect Disord 1996;39:31–38
- 11. Rubey RN, Johnson MR, Emmanuel N, et al. Fluoxetine in the treatment of anger: an open clinical trial. J Clin Psychiatry 1996;57:398–401
- Fava M, Anderson K, Rosenbaum JR. Are thymoleptic-responsive "anger attacks" a discrete clinical syndrome? Psychosomatics 1993;34:350–355
- Fava M, Rappe SM, West J, et al. Anger attacks in eating disorders. Psychiatry Res 1995;56:205–212
- Fava M, Davidson K, Alpert JE, et al. Hostility changes following antidepressant treatment: relationship to stress and negative thinking. J Psychiatry Res 1996;30:459–467
- Mammen OK, Shear MK, Jenning K, et al. Case study: ego-dystonic anger attacks in mothers of young children. J Am Acad Child Adolesc Psychiatry 1997;36:1374–1377
- Kellner R. Psychosomatic Syndrome and Somatic Symptoms. Washington, DC: American Psychiatric Press; 1991:189–213
- Spielberger CD, Johnson EH, Russell SF, et al. The experience and expression of anger: construction and validation of an anger expression scale. In: Chesney MA, Rosenman RH, eds. Anger and Hostility in Cardiovascular and Behavioral Disorders. Washington, DC: Hemisphere; 1985:5–30
- Dimsdale JE, Pierce C, Schoenfield D, et al. Suppressed anger and blood pressure: the effect of race, sex, social class, obesity and age. Psychosom Med 1986;48:430–435
- Koh KB, Kim SJ. Comparison of anger between patients with essential hypertension and normal controls. Korean J Psychosom Med 1995:3: 19–27
- Harbin TJ. The relationship between type A behavior pattern and physiological responsivity: a quantitative review. Psychophysiology 1989; 26:110–119
- Tschannen TA, Duckro PN, Margolis RB, et al. The relationship of anger, depression, and perceived disability among headache patients. Headache 1992;32:501–503
- 22. Klauber J. An attempt to differentiate a typical form of transference in neurotic depression. Int J Psychoanal 1966;47:539–545
- White RB. Current psychoanalytic concepts of depression. In: Fann WE, Karacan I, Pokorny AD, et al, eds. Phenomenology and Treatment of Depression. New York, NY: Spectrum; 1977:127–141
- Beck AT, Hurvich MS. Psychological correlates of depression, 1: frequency of "masochistic" dream content in a private practice sample. Psychosom Med 1959;21:50–55
- Newman RS, Hirt M. The psychoanalytic theory of depression: symptoms as a function of aggressive wishes and level of field articulation. J Abnorm Psychol 1983;92:42–48
- Yesavage JA. Direct and indirect hostility and self-destructive behavior by hospitalized depressives. Acta Psychiatr Scand 1983;68:345–350
- Fava GA, Kellner R, Lisansky J, et al. Hostility and recovery from melancholia. J Nerv Ment Dis 1986;174:414–417
- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association; 1994
- Chon KK. Mode of anger expression and somatization [abstract]. In: Abstracts of the Annual Academic Meeting of the Korean Psychological Association; 1991; Seoul, Korea. 9–15
- Koh KB, Park JK, Kim CH. Development of the Stress Response Inventory. J Korean Neuropsychiatr Assoc 2000;39:707–719
- Kim KI, Kim JH, Won HT. Korean Manual of Symptom Checklist-90-Revision. Seoul, Korea: Chung Ang Aptitude Publishing Co; 1984
- Derogatis LR, Rickels K, Rock AF. The SCL-90 and MMPI: a step in the validation of a new report scale. Br J Psychiatry 1976;128:280–289
- Fava GA, Kellner R, Munari F, et al. Losses, hostility, and depression. J Nerv Ment Dis 1982;170:474–478
- Biaggio MK, Godwin WH. Relation of depression to anger and hostility constructs. Psychol Rep 1987;61:87–90
- Kendell RE. Relationship between aggression and depression: epidemiological implications of a hypothesis. Arch Gen Psychiatry 1970;22: 308–318
- Moore TW, Paolillo JG. Depression: influence of hopelessness, locus of control, hostility and length of treatment. Psychol Rep 1984;54: 875–881
- Schless AP, Mendels J, Kipperman A, et al. Depression and hostility. J Nerv Ment Dis 1974;159:91–100

- 38. Cochrane N. The role of aggression in the pathogenesis of depressive illness. Br J Med Psychol 1975;48:113-130
- Weissman M, Klerman GL, Paykel ES. Clinical evaluation of hostility in 39 depression. Am J Psychiatry 1971;128:41-46
- Weissman M, Fox K, Klerman GL. Hostility and depression associated 40. with suicide attempts. Am J Psychiatry 1973;130:450-455
- 41. Abramson LY, Seligman MEP, Teasdale JD. Learned helplessness in humans: critique and reformulation. J Abnorm Psychol 1978;87:49-74
- 42. van Praag HM, Plutchik R, Conte H. The serotonin hypothesis of (auto) aggression: critical appraisal of the evidence. Ann NY Acad Sci 1986;487: 150-167
- 43. Coyne JC. Depression and the response of others. J Abnorm Psychol 1976;

85:186-193

- 44. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Third Edition. Washington, DC: American Psychiatric Association; 1980
- 45. Kaplan GA, Roberts RE, Camacho TC, et al. Psychosocial predictors of depression: prospective evidence from the human population laboratory studies. Am J Epidemiol 1987;125:206-220
- 46. Slack D, Vaux A. Undesirable life events and depression: the role of event appraisals and social support. J Soc Clin Psychol 1988;7:290-296
- restor are: 47. Turner RJ, Avison WR. Gender and depression: assessing exposure and vulnerability to life events in a chronically strained population. J Nerv Ment Dis 1989;177:443-455